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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,421	09/16/2003	Kenji Kamei	008312-0305985	2076

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EXAMINER

CALEY, MICHAEL H

ART UNIT PAPER NUMBER

2871

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,421

Applicant(s)

KAMEI, KENJI

Examiner

Michael H. Caley

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-21 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance: See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02142005 06062005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 18 is objected to because of the following informalities:

“a light source” of line 5 should be corrected to read --the light source-- to properly refer to the light source of line 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 15, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase (U.S. Patent No. 6,033,077) in view of Shiraishi et al. (U.S. Patent No. 6,394,608 “Shiraishi”).

Regarding claims 14 and 18, Iwase discloses an optical engine and projection type display apparatus having:

a housing (Figure 1 elements 20 and 30);

a lens (Figure 1 element 13A) configured to allow a light ray emitted from a light source (Figure 1 element 10) to enter an inside of the housing;

a plurality of light separation elements (Figure 1 elements 12a, 12b, and 12c) configured to separate the light ray entered via the lens into a plurality of primary color light rays;

a plurality of reflection type liquid crystal elements (Figure 1 elements 22a, 22b, and 22c) that are arranged to correspond to the plurality of primary color light rays separated by the light separation elements, and are configured to emit reflected light rays modulated from the primary color light rays based on an image signal;

a plurality of reflection polarizing plates (Figure 1 elements 21a, 21b, and 21c) that are arranged to correspond to the plurality of reflection type liquid crystal elements, and are configured to reflect the primary color light rays separated by the light separation elements, thereby allowing them to enter the reflection type liquid crystal elements and configured to allow the reflected light rays emitted from the reflection type liquid crystal elements to pass therethrough (Figure 1, see light paths);

a combining prism (Figure 1 element 23) configured to combine the light rays that passed the plurality of reflection polarizing plates; and

a projection lens configured to emit the light rays combined by the combining prism outside;

wherein an incident surface of the lens, an outgoing surface of the projection lens are arranged so as to be exposed to the outside.

Iwase fails to disclose the housing as forming a sealed space. Iwase also fails to disclose a radiator provided on a rear surface of each of the plurality of reflection type liquid crystal

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elements whereby each radiator and rear surface of the reflection type liquid crystal elements is exposed to an outside of the housing. Shiraishi, however, teaches the housing (Figure 9 element 15) as forming a sealed space in an analogous type of projector display having reflective liquid crystal elements (Column 5 lines 48-55). Shiraishi further teaches such radiators (Figure 9 element 31) as a means of transferring heat generated in the liquid crystal panel outside of the housing (Column 7 lines 7-22) and a ventilation path (Figure 9 elements 6 and 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a sealed space from the housing as proposed. Shiraishi teaches a sealed housing as an advantageous feature for preventing dust accumulation (Column 2 lines 15-18). One would have been motivated to seal the housing space in the projection device disclosed by Iwase as a means of preventing the occurrence of shadows in an image due to dust (Shiraishi, Column 4 lines 48-50).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have fixed radiators to the reflection type liquid crystal elements and housing such that the radiators and rear surfaces of the reflection type liquid crystal elements be exposed to an outside of the housing in the device disclosed by Iwase. One would have been motivated to provide such a cooling mechanism to maintain the liquid crystal elements at their normal operating temperatures (Shiraishi, Column 7 lines 1-6) while maintaining a sealed environment for the optical elements to prevent dust accumulation.

Regarding claims 15 and 19, Iwase fails to disclose a cooling fan, wherein the cooling fan is located outside of the housing. Shiraishi, however, teaches a cooling fan outside of the housing (Figure 2 element 7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a cooling fan outside the housing in the device disclosed by Iwase. One would have been motivated to provide such a cooling mechanism to maintain the liquid crystal elements at their normal operating temperatures (Shiraishi, Column 7 lines 1-6) while maintaining a sealed environment for the optical elements to prevent dust accumulation.

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Shiraishi and in further view of Miyatake (U.S. Patent No. 5,327,270).

Iwase discloses polarizing plates located inside the housing which control polarizing characteristics of the reflection type liquid crystal elements arranged in light paths on which the primary color light rays separated by the light separation elements pass to the reflection type liquid crystal elements (Figure 1 elements 20A, 20B, and 20C; Column 4 lines 28-43). Iwase fails to disclose a phase difference plate arranged as proposed. Miyatake, however, teaches such a phase difference plate placed in the light path as proposed as a means of preserving a high contrast of a projected image obliquely incident on the polarizing beam splitters (Figure 9 elements 68, 69, and 70; Column 7 line 67 – Column 8 line 28). Furthermore, Miyatake incorporates such phase difference plates in a projection device having analogous construction to that disclosed by Iwase, having obliquely arranged polarizing beam splitters and reflective liquid crystal elements.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to have placed phase difference plates as taught by Miyatake in the light path of the device disclosed by Iwase as proposed. One would have been motivated to place the phase difference plate as proposed to benefit from an increased brightness and contrast level in the projected image according to the teachings of Miyatake.

Claims 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Shiraishi and in further view of Borrelli.

Iwase fails to disclose optical elements other than the reflection type liquid crystal elements as made of inorganic materials. Borrelli, however, teaches inorganic optical elements as optimal for liquid crystal display projection applications due to degradation that occurs over time to organic materials used in such elements when used with an intense light source (Column 1 lines 8-32). Borrelli teaches an advantageous inorganic reflective polarizer element (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the optical elements from inorganic materials as proposed. One would have been motivated to use inorganic materials as taught by Borrelli to avoid degradation of the optical components that may occur from use with an intense light source typical in projection devices.

Response to Arguments

Applicant's arguments filed 5/4/05 have been fully considered but they are not persuasive.

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Applicant argues that newly added claims 14 and 18 are allowable over the cited references and asserts that the references fail to teach or suggest the claimed arrangement of components in the optical engine. The examiner disagrees. An explanation of how the references are applied against the claims is set forth above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael H. Caley

July 23, 2005



mhc



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